

Watch Out for

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The heat wave that gripped the western and central U.S. last summer resulted in many heat-related deaths. The seriousness of respecting hot weather—or a hot working environment—was punctuated when Minnesota Vikings tackle, 27-year-old Korey Stringer, and University of Florida freshman Eraste Austin died. Both succumbed to heat during football practice.

Excess heat places abnormal stress on the body. When body temperature rises even a few degrees above normal, muscles cramp and leave one feeling weak and disoriented. Excess body heat can result in serious illness, and even death, unless the body cools down. Special precautions must be taken to keep the body cool, whether outside in summer heat or in hot buildings or shipyard spaces.

Because industrial environments present machinery hazards, workers often wear extra clothing, respiratory protection, and other personal protective equipment (PPE), which can increase body heat, keep sweat from evaporating, and contribute to heat-related illnesses.

Sweating is one way the body cools itself. It is effective only when humidity levels are low enough to permit evaporation, and when fluids and salts lost through sweating are replenished. To help the body continue to cool itself, frequently drink water.

Another way for the body to react to high external temperatures is to circulate blood to the skin, which increases skin temperature and lets excess heat escape. If, however, body muscles are engaged in physical activity, less blood is available to flow to the skin to release heat.



Photos by Matthew J. Thomas

Heat Stress!

If the body cannot dissipate excess heat, the body's core temperature rises, and the heart rate increases. As the body continues to store excess heat, a person loses the ability to concentrate. He or she also may become irritable or feel sick, and often lose their desire to drink fluids. The next stage of heat stress usually is fainting, and that may be followed by death unless the person is removed from the heat-stress environment.

Individual heat-stress susceptibility varies from person to person. Age, weight, physical fitness, metabolism, the use of alcohol and drugs, and medical conditions like hypertension can affect the body's sensitivity to heat.

Heat stroke is the most serious threat to workers in a hot environment. It occurs when the body's temperature regulation fails, and the body temperature rises to critical levels. During heat stroke, sweating stops, and the body no longer is able to rid itself of excess heat—this is a medical emergency. Signs of heat stroke include confusion; irrational behavior; loss of consciousness; convulsions; coma; lack of perspiration; hot, dry skin, which may be red, mottled, or bluish; and an abnormally high body temperature. Heat-stroke victims will die unless treated promptly. While awaiting medical help, move victims to a cooler area, and soak their clothing with cool water. Fan vigorously to increase cooling. Prompt first aid to a heat-stroke victim can prevent injuries to the brain or other vital organs.

Heat exhaustion results from loss of fluids through sweating because a person didn't drink enough liquids, take in enough electrolytes, or both. Primary symptoms include perspiration, feelings of extreme weakness or fatigue, thirst, giddiness, nausea, or headache. The skin is clammy, the complexion may appear pale

or flushed, and body temperature may be normal or slightly higher than normal. These symptoms resemble those of heat stroke, and—like heat stroke—it is a medical emergency. Fortunately, people suffering from heat exhaustion respond readily to prompt treatment, which is simple: Victims should rest in a cool place and drink plenty of fluids. Because the body responds readily to treatment does not mean heat exhaustion should be taken lightly. Victims may be injured if they faint, and if they faint while operating machinery or driving a car, the hazards are multiplied.

People faint because the brain does not receive enough oxygen after blood has collected in the extremities. It is rapid and unpredictable, though victims usually quickly recover after lying down. To prevent fainting, workers gradually should acclimate their bodies to a hot environment. Moving about, rather than staying stationary, also can reduce the possibility of fainting.

Heat rash is the most common problem in hot working environments. Known as prickly heat, it occurs in hot and humid environments where sweat cannot easily evaporate from the skin's surface. The rash appears as red pimples, and usually strikes in areas where clothing is restrictive. As sweating increases, the pimples create a prickling sensation. The rash usually disappears when an affected individual returns to a cool environment. Heat-rash prevention involves resting in a cool place and letting the skin dry. Heat-rash pimples can become infected if not treated.

Recognizing early warning signs of heat stress increases the chances of preventing heat-related problems. Supervisors should recognize heat-stress indicators and should let workers interrupt their work if they appear at risk.



Outside temperatures can combine with the working environment to create heat-stress dangers. These Guam-based Seabees are fighting a fire, and are dealing with both hot, tropical temperatures, and heat from the fire. Nevertheless, the three Seabees should not have rolled up their sleeves while fighting the fire. While the Seabees appear to be far enough away from the fire to not have to wear firefighting gear, appropriate safety equipment must be worn.

Following are commonly accepted “cool work” practices to help avoid heat stress.

- ✓ Drink plenty of water, as much as one quart per hour.
- ✓ Wear loose-fitting, light-colored clothes so you can sweat freely.
- ✓ Supervisors should consider workers’ physical conditioning when determining their fitness for working in hot environments.
- ✓ Incorporate rest periods in a cool area into the work schedule. If possible, schedule heavy work during cooler parts of the day. Provide appropriate protective clothing.

Besides administrative work practices, heat-stress risk can be reduced further through some engineering controls:

- ✓ Insulate or shield radiant-heat sources.
- ✓ Use power tools to reduce manual labor.
- ✓ Don clothing that provides protection from heat sources.
- ✓ Educate personnel to recognize heat-stress symptoms. ☺

(This article was based on “Heat Illnesses,” published in the Pearl Harbor Shipyard and Intermediate Maintenance Facility’s Safetygram of July 5, 2001.—Ed.)



For More Info...

Refer to the NAVOSH Program Manual for Forces Afloat, OpNavinst 5100.19D, Chapter B5, Heat Stress, for guidance about preventing heat stress injuries on the job.